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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,399	03/30/2001	Xin Li	8371-124	8768

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EXAMINER

JOHNSON, TIMOTHY M

ART UNIT PAPER NUMBER

2625

DATE MAILED: 03/02/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,399

Applicant(s)

LI, XIN

Examiner

Timothy M Johnson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2-3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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Drawings

1. The drawings are objected to because "CLASS = 2" is obscured in Fig. 3.

Correction is required.

A proposed drawing correction or corrected drawings are required in reply to this Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Disclosure

2. The disclosure is objected to because of the following informalities: On page 1, line 24, change "'ZiP" to "Ziv". Appropriate correction is required.
3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The Examiner suggests the following title:

"Compound document compression based on neighboring pixels".

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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For claim 4, step d appears to be incorrectly recited. As step d is recited, there is a possibility that a "Yes" can be coded in accordance with either steps b or c.

Therefore, step d must clearly recite that the current pixel is not equal to the local minimum and is also not equal to the local maximum.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seroussi et al., 5,835,034, in view of Wu et al., 5,903,676.

For claim 1, a method for compression of compound images, the method comprising: a) determining a classification for a current pixel based upon its causal neighbors; b) coding the pixel using conditional coding determined by the classification, producing a symbol for the pixel is provided by Seroussi in at least c. 7, lines 10-60, the third full paragraph in c. 10, the second full paragraph in c. 11, the paragraph bridging cols. 12-13, the last full paragraph in c. 20, where it is clear that the surrounding pixels (specifically, the causal neighbors) provide a classification of the image type and code accordingly, in the Experimental Results section in c. 18, where compound images are clearly provided by Seroussi, and the first full paragraph in the Detailed Description in c.

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6, for explicit recitation of condition coding; and c) mapping the symbol to an output bit stream is clearly provided by Seroussi by the mapping table, Table 1 in the paragraph bridging cols. 11-12, which is also mapped as an encoded value in the first full paragraph in c. 7 and as noted in c. 14, lines 18-35. A classification mode is considered obvious over Seroussi as argued above, but Seroussi does not explicitly provide for a "mode" for classifying. Wu explicitly provide for a classification mode in at least the abstract, and can be used with the classification of pixels of Seroussi. It would've been obvious to one having ordinary skill in the art at the time the invention was made to use a classification mode, since this provides for an adaptive compression system that adapts to image content of all types thus providing for at least improved coding efficiency as well as simple logic.

For claim 2, the method of claim 1, wherein determining the classification for a current pixel further comprises: a) obtaining a number of distinct values for the causal neighbors by no more than four logical comparisons; and b) determining the classification according to the number of distinct values appearing in the causal neighbors is provided by Seroussi in at least the third full paragraph in c. 10 and the paragraph bridging cols. 12-13 for example, where only three comparisons are made, of which comparisons provide for a classification in accordance with the values determined.

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For claim 3, the method of claim 1, wherein the classification of the current pixel is class 0, and the method further comprises: a) determining whether the current pixel is equal to its causal neighbors; b) if the current pixel is equal to its causal neighbors, encoding a "Yes" symbol by conditional coding is considered provided by Seroussi in at least the paragraph bridging cols. 12-13, where Seroussi explicitly teaches the possibility of all neighboring pixels equaling each other, which clearly corresponds to a specific classification of the image, and if this is the case, then a "Yes" is considered coded, since Applicant considered a "Yes" as a zero value (Applicant's specification on page 4, line 2, as Seroussi explicitly provides for a zero value also. And c) if the current pixel is not equal to its causal neighbors, encoding a "No" symbol by conditional coding and coding the pixel according to a continuous mode is considered provided by Seroussi where a "No" symbol, i.e. a one, is coded, which indicates that the neighboring pixels are no longer equal, and the pixel is coded in accordance with a continuous mode, since when neighboring pixels are not equal, this means that the image can be a continuous type of image and is a requirement for a continuous image, and is further corroborated by the first full paragraph in the Detailed Description in c. 6, where at least some of the image is a continuous type of image, and other types of image data is within the image as noted in the Experimental Results starting in c. 18, line 15. Wu provides for at least two pixel classes.

For claim 4, see the rejection of at least claims 1 and 3 and the third full paragraph in c. 8, where "Yes" and "No" correspond to binary values, and symbols are

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explicitly provided for based on the causal neighbors including a minimum, maximum, and otherwise.

For claim 5, see the rejection of at least claim 1 for at least obtaining a prediction of the current pixel from the four causal neighbors and mapping to an output including a symbol by conditional coding. Determining a prediction residue from the prediction of the current pixel is provided by Seroussi in at least the paragraph bridging cols. 8-9, and see also Figs. 2-3 and 7 for example. Representing a symbol by a binary expansion tree and then encoding node decisions is provided by Seroussi in at least c. 14, lines 18-35.

For claim 6, the method of claim 1, wherein conditional coding further comprises: a) obtaining a context model for binary symbols from the causal neighbors and coding a current symbol according to the context model; b) obtaining a quantized context model for continuous symbols from the causal neighbors and coding a current symbol according to the context model; and c) representing non-binary symbols using a binary expansion tree coding a symbol by a series of decision nodes traversing the expansion tree, wherein coding of the decision node is always conditioned upon a parent in the binary expansion tree is provided by Seroussi in at least the paragraph bridging cols. 8-9, at least c. 10, lines 1-62, and c. 14, lines 18-35, where the nodes are child nodes, and therefore have parents. Obtaining a context model for ternary symbols is not explicitly provided by Seroussi, but is conventional and well known and is provided by

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Wu in at least c. 4, lines 21-47, and c. 12, line 39 – c. 13, line 14, which can be used with contexts of Seroussi. It would've been obvious to one having ordinary skill in the art at the time the invention was made to use the well known ternary context, since the addition of a ternary coding system adds little to the system complexity and because the switch to such a mode is context depend, automatic, and transparent to the user.

For claim 8, the method of claim 6, wherein coding of binary symbols is accomplished by an adaptive binary arithmetic coder is provided by Wu in at least the paragraph bridging cols. 12-13.

For claim 9, see the rejection of at least claim 1, and see at least c. 15, lines 25-39, and the fourth full paragraph in c. 23 for machine readable instructions.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seroussi et al., 5,835,034, in view of Wu et al., 5,903,676, as applied to claims above, and further in view of Memon et al., A comparison of prediction schemes proposed for a new lossless image compression standard.

For claim 7, the method of claim 4, wherein the prediction of the current pixel further comprises using a median edge detection predictor is not explicitly provided by Seroussi, but Seroussi does explicitly recite the use of edges in the predictive coding in at least c. 7, lines 10-60. Using median edge detection can be used by Seroussi as is well known and taught by Memon in at least section 2.1 on page 309. It would've been

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obvious to one having ordinary skill in the art at the time the invention was made to use a median edge detection MED with the edge detection of Seroussi, since Memon has empirically determined that the MED can give the best results among a plurality of image compressors, and in general that the simple median adaptive predictor of MED performs very well because it is a simple scheme and yet performs as well on the whole, if not better than any predictor in the group studied by Memon as noted in section 5 on page 312.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy M Johnson whose telephone number is 703-306-3096. The examiner can normally be reached on Monday – Friday from 5:30 to 2:00.

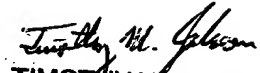
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta, can be reached on Monday – Friday from 9:30 to 5:00. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Timothy M. Johnson
Patent Examiner
Art Unit 2625
February 25, 2004


TIMOTHY M. JOHNSON
PRIMARY EXAMINER